Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the above-captioned application.

Listing of Claims:

Claims 1-412 (cancelled)

413. (currently amended) A system for detecting an analyte in a fluid comprising:

a light source;

a sensor array, the sensor array comprising a supporting member comprising at least one cavity formed within the supporting member;

a particle, the particle positioned in the cavity, wherein the particle ~~is configured to~~ produces a signal when the particle interacts with an analyte during use;

a vacuum apparatus ~~coupled to the cavity~~a vacuum apparatus at least partially incorporated into the supporting member, ~~wherein the vacuum apparatus is adapted to pull fluid through the cavity during use, wherein the vacuum apparatus is configured to pull fluid through the cavity during use~~ wherein the vacuum apparatus is coupled to the cavity, and wherein the vacuum apparatus produces a vacuum in the cavity such that the produced vacuum pulls fluid through the cavity during use; and

a detector, the detector being configured to detect the signal produced by the interaction of the analyte with the particle during use;

wherein the light source and detector are positioned such that light passes from the light source, to the particle, and onto the detector during use.

414. (original) The system of claim 413, wherein the system comprises a plurality of particles positioned within a plurality of cavities, ~~and wherein the system is configured to substantially simultaneously detect a plurality of analytes in the fluid~~ and wherein at least a first part of the plurality of particles is adapted to detect at least one analyte, and wherein the analyte that is detected by the portion of the plurality of particles is not detected by second part of the plurality of particles.

415. (currently amended) The system of claim 413, wherein the system comprises a plurality of particles positioned in the cavity.

416. (original) The system of claim 413, wherein the light source comprises a light emitting diode.

417. (original) The system of claim 413, wherein the light source comprises a white light source.

418. (original) The system of claim 413, wherein the sensor array further comprises a bottom layer and a top cover layer, wherein the bottom layer is positioned below a bottom surface of the supporting member, and wherein the top cover layer is positioned above the upper surface of the supporting member, and wherein the bottom layer and the top cover layer are positioned such that the particle is substantially contained within the cavity by the bottom layer and the top cover layer.

419. (original) The system of claim 413, wherein the bottom layer and the top cover layer are substantially transparent to light produced by the light source.

420. (original) The system of claim 413, wherein the sensor array further comprises a bottom layer and a top cover layer, wherein the bottom layer is coupled to a bottom surface of the supporting member, and wherein the top cover layer is coupled to a top surface of the supporting member; and wherein both the bottom layer and the top cover layer are coupled to the supporting member such that the particle is substantially contained within the cavity by bottom layer and the top cover layer.

421. (original) The system of claim 420, wherein the bottom layer and the top cover layer are substantially transparent to light produced by the light source.

422. (original) The system of claim 413, wherein the sensor array further comprises a bottom layer coupled to the supporting member, and wherein the supporting member comprises silicon, and wherein the bottom layer comprises silicon nitride.

423. (original) The system of claim 413, further comprising a conduit coupled to the sensor array, wherein the conduit is configured to conduct the fluid sample to and away from the sensor array.

424. (currently amended) The system of claim 413, wherein the supporting member is formed from a plastic material, and wherein the sensor array further comprises a top cover layer, the top cover layer being coupled to the supporting member such that the particle is substantially contained within the cavity, and wherein the top cover layer ~~is configured~~comprises one or more openings that ~~to~~ allow the fluid to pass through the top cover layer to the particle, and wherein both the supporting member and the top cover layer are substantially transparent to light produced by the light source.

425. (original) The system of claim 413, wherein the cavities are configured to allow the fluid to pass through the supporting member during use.

426. (original) The system of claim 425, wherein the cavity is configured to substantially contain the particle.

427. (original) The system of claim 425, further comprising a cover layer coupled to the supporting member and a bottom layer coupled to the supporting member, wherein the cover layer and the bottom layer are removable.

428. (original) The system of claim 425, further comprising a cover layer coupled to the supporting member and a bottom layer coupled to the supporting member, wherein the cover layer and the bottom layer are removable, and wherein the cover layer and the bottom layer include openings that are substantially aligned with the cavities during use.

429 (original) The system of claim 425, further comprising a cover layer coupled to the supporting member and a bottom layer coupled to the supporting member, wherein the bottom layer is coupled to a bottom surface of the supporting member and wherein the cover layer is removable, and wherein the cover layer and the bottom layer include openings that are substantially aligned with the cavities during use.

430. (original) The system of claim 425, further comprising a cover layer coupled to the supporting member and a bottom layer coupled to the supporting member, wherein an opening is formed in the cover layer substantially aligned with the cavity, and wherein an opening is formed in the bottom layer substantially aligned with the cavity.

431. (original) The system of claim 425, wherein the cavity is substantially tapered such that the width of the cavity narrows in a direction from a top surface of the supporting member toward a bottom surface of the supporting member, and wherein a minimum width of the cavity is substantially less than a width of the particle.

432. (original) The system of claim 425, wherein a width of a bottom portion of the cavity is substantially less than a width of a top portion of the cavity, and wherein the width of the bottom portion of the cavity is substantially less than a width of the particle.

433. (currently amended) The system of claim 425, further comprising a cover layer coupled to the supporting member and a bottom layer coupled to the supporting member, wherein the ~~bottom layer is configured to support the particle~~particle is positioned on the bottom layer, and wherein an opening is formed in the cover layer substantially aligned with the cavity.

434. (original) The system of claim 425, wherein the supporting member comprises a dry film photoresist material.

435. (original) The system of claim 425, wherein the supporting member comprises a plurality of layers of a dry film photoresist material.

436. (original) The system of claim 425, wherein an inner surface of the cavity is coated with a reflective material.

437. (original) The system of claim 413, wherein the detector comprises a charge-coupled device.

438. (original) The system of claim 413, wherein the detector comprises an ultraviolet detector.

439. (original) The system of claim 413, wherein the detector comprises a fluorescence detector.

440. (original) The system of claim 413, wherein the detector comprises a semiconductor based photodetector, and wherein the detector is coupled to the sensor array.

441. (original) The system of claim 413, wherein the particle ranges from about 0.05 micron to about 500 microns.

442. (original) The system of claim 413, wherein a volume of the particle changes when contacted with the fluid.

443. (currently amended) The system of claim 413, wherein the vacuum apparatus comprises a vacuum chamber, and wherein the vacuum chamber comprises a breakable barrier positioned between the chamber and the conduit, and wherein the chamber ~~is configured to pull the fluid through~~applies a vacuum to the conduit when the breakable barrier is punctured.

444. (original) The system of claim 413, wherein the vacuum apparatus comprises a vacuum pump.

445. (original) The system of claim 413, wherein the particle comprises a receptor molecule coupled to a polymeric resin.

446. (original) The system of claim 413, wherein the polymeric resin comprises polystyrene-polyethylene glycol-divinyl benzene.

447. (original) The system of claim 446, wherein the receptor molecule produces the signal in response to the pH of the fluid.

448. (original) The system of claim 446, wherein the analyte comprises a metal ion, and wherein the receptor produces the signal in response to the presence of the metal ion.

449. (original) The system of claim 446, wherein the analyte comprises a carbohydrate, and wherein the receptor produces a signal in response to the presence of a carbohydrate.

450. (original) The system of claim 446, wherein the particle further comprises a first indicator and a second indicator, the first and second indicators being coupled to the receptor, wherein the interaction of the receptor with the analyte causes the first and second indicators to interact such that the signal is produced.

451. (original) The system of claim 446, wherein the particle further comprises an indicator, wherein the indicator is associated with the receptor such that in the presence of the analyte the indicator is displaced from the receptor to produce the signal.

452. (original) The system of claim 446, wherein the receptor comprises a polynucleotide.

453. (original) The system of claim 446, wherein the receptor comprises a peptide.

454. (original) The system of claim 446, wherein the receptor comprises an enzyme.

455. (original) The system o f claim 446, wherein the receptor comprises a synthetic receptor.

456. (original) The system of claim 446, wherein the receptor comprises an unnatural biopolymer.

457. (original) The system of claim 446, wherein the receptor comprises an antibody.

458. (original) The system of claim 446, wherein the receptor comprises an antigen.

459. (original) The system of claim 446, wherein the analyte comprises phosphate functional groups, and wherein the particle ~~is configured to~~ produces the signal in the presence of the phosphate functional groups.

460. (currently amended) The system of claim 413, wherein the analyte comprises bacteria, and wherein the particle ~~is configured to~~ produces the signal in the presence of the bacteria.

461. (original) The system of claim 413, wherein the system comprises a plurality of particles positioned within a plurality of cavities, and wherein the plurality of particles produce a detectable pattern in the presence of the analyte.

462. (original) The system of claim 413, further comprising a filter coupled to the conduit and the sensor array, wherein the fluid passes through the filter before reaching the sensor array.

463. (original) The system of claim 462, wherein the fluid is a blood sample, and wherein the filter comprises a membrane for the removal of particulates.

464. (original) The system of claim 462, wherein the fluid is a blood sample, and wherein the filter comprises a membrane for removal of white and red blood cells from the blood.

465. (currently amended) The system of claim 413 further comprising a reagent delivery reservoir coupled to the sensor array via a conduit, wherein the fluid passes through the reagent delivery reservoir before entering the cavity, and wherein reagents enter the fluid as the fluid passes through the reagent delivery reservoir during use~~, wherein the reagent delivery reservoir is configured to deliver reagents to the particles during use~~.

466. (original) The system of claim 465, wherein the reagent delivery reservoir comprises an indicator.

Claims 467-489 (cancelled)

490. (currently amended) A system for detecting an analyte in a fluid comprising:

a sensor array, the sensor array comprising a supporting member comprising at least one cavity formed within the supporting member;

a particle, the particle positioned within the cavity, wherein the particle ~~is configured to~~ produces a signal when the particle interacts with an analyte during use;

a vacuum apparatus at least partially incorporated into the supporting member~~coupled to the cavity~~, wherein the vacuum apparatus is coupled to the cavity, and wherein the vacuum apparatus produces a vacuum in the cavity such that the produced vacuum pulls fluid through the cavity during use~~wherein the vacuum apparatus is configured to pull fluid through the cavity during use~~; and

a detector, the detector being configured to detect the signal produced by the interaction of the analyte with the particle during use;

491. (currently amended) The system of claim 490, wherein the system comprises a plurality of particles positioned in a plurality of cavities, and wherein at least a first part of the plurality of particles is adapted to detect at least one analyte, and wherein the analyte that is detected by the portion of the plurality of particles is not detected by second part of the plurality of particles~~and wherein the system is configured to substantially simultaneously detect a plurality of analytes in the fluid~~.

492. (previously presented) The system of claim 490, wherein the system comprises a plurality of particles positioned in the cavity.

Claims 493-725 (cancelled)

726. (currently amended) A system for detecting an analyte in a fluid comprising:

a light source;

a sensor array, the sensor array comprising a supporting member comprising at least one cavity formed within the supporting member;

a particle, the particle positioned within the cavity, wherein the particle ~~is configured to~~ produces a signal when the particle interacts with an analyte during use;

a vacuum at least partially incorporated into the supporting member, wherein the vacuum is coupled to the cavity, and wherein the vacuum produces a vacuum in the cavity such that the produced vacuum pulls fluid through the cavity during use~~configured to pull fluid through the cavity during use~~; and

a detector, the detector being configured to detect the signal produced by the interaction of the analyte with the particle during use;

wherein the light source and detector are positioned such that light passes from the light source, to the particle, and onto the detector during use.

Claims 727-729 (cancelled)

730. (previously presented) The system of claim 726, further comprising a microvalve configured to control the vacuum.